Policy Effects of International Taxation on Firm Dynamics and Capital Structure
[Currently Under Re-Construction]

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Question

- How do tax reforms targeted at multinational firms affect domestic productivity, economic activity and welfare?

Motivation: Recent Policy Episodes

- U.S. Tax Cuts and Jobs Act (2017) removed the *repatriation tax*.
  - Tax the U.S. Government levied on U.S. firms' overseas earnings.

- OECD proposals call for a "unified" approach (October 2019).
 - Sales-based taxation of multinationals.

What I Do

(i) Develop a quantitative model for evaluating these types of tax reforms on the macroeconomy. Features:

    1 Heterogeneity and selection effects,

    2 Dynamics through firm-level capital accumulation,

    3 Financial frictions.

(ii) Apply the general framework to removing the U.S. repatriation tax.

(iii) Remove features in the model to gauge their quantitative significance.

Policy Application: Institutional Details

IBM Global HQ, NYC, USA   IBM UK Subsidiary

£££
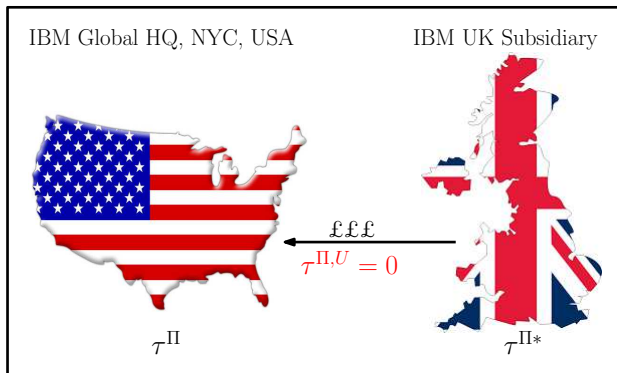
τ^{Π} $\tau^{\Pi*}$
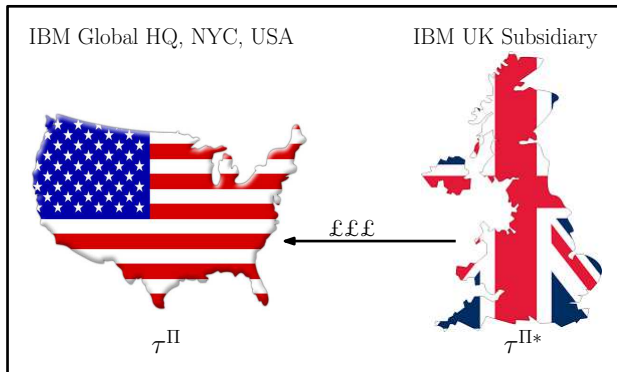
Policy Application: Institutional Details
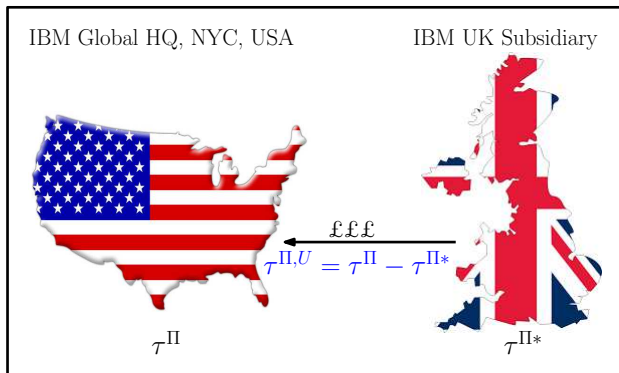
- $\tau^{\Pi,U} = \tau^{\Pi} - \tau^{\Pi*}$ is pre-reform (pre-2018) repatriation tax.

Policy Application: Institutional Details

- $\tau^{\Pi,U} = \tau^{\Pi} - \tau^{\Pi*}$ is pre-reform (pre-2018) repatriation tax.

- $\tau^{\Pi,U} = 0$ post-reform (Jan 2018–).

Channels

- Did the U.S. reform increase or decrease domestic production?

- Depends on selection effects in both directions.

- Selection effects interact with novel features of the model.

- Overall impact is a quantitative question.

Policy Application: Tradeoff

- Reform increases the value of being a U.S. multinational.

- **Negative**:

    - More multinationals and fewer exporters.

    - ↓ domestic export production (offshoring).

- **Positive**:

    - ↑ value to being a U.S. startup (higher business dynamism).

    - ↑ domestic productivity endogenously.

    - ↑ domestic production.

Preview of Results

(I) Baseline results:

- Business dynamism effect dominates the offshoring channel.

- ↑ U.S. goods production 0.1%.

- ↑ U.S. welfare 1.0%.

- U.S. revenue neutral.

Preview of Results

(II) Dynamics are quantitatively significant.

- Offshoring effect larger in a static analogue.

- ↓ U.S. welfare 1.0% in static analogue.

Preview of Results

(III) Financial frictions are quantitatively significant.

- Business dynamism effect weakened without financial frictions.

- Reform welfare gain 1/4 of that in the baseline.

Model Environment

- Two countries: H (small open economy) and F.

- H household:

    - CRRA preferences,

    - Consumes goods made by H and F firms.

    - Saves through shares in H firms and bonds.

Model Environment

- H firms draw idiosyncratic persistent productivity shocks.

- Discrete choices for H firms:

  - Exit,

  - Domestic only,

  - Exporter,

  - Multinational,

  - Offshoring multinational.

- Iceberg cost of shipping goods.

- Sunk and period-by-period fixed costs.

Model Environment

- Dynamics and capital:

  - Firm-level capital accumulation.

  - Capital in H and F if a multinational.

  - Convex adjustment cost.

Model Environment

- Financial frictions and capital structure:

  - H parents issue external financing.

  - Debt: riskless and collateralised by capital stocks.

  - Equity: negative dividend to shareholders.

  - Friction 1: collateral constraint.

  - Friction 2: tax deductibility of interest.

 - Friction 3: costly equity issuance.

Calibration and Quantitative Exercise

- Model calibrated to U.S. pre-TCJA data.

- Exercise:

    - At $t = 0$: pre-reform steady state with $\tau^{\Pi,U} = \tau^{\Pi} - \tau^{\Pi*}$.

    - At $t = 1$: set $\tau^{\Pi,U} = 0$ going forwards indefinitely.

    - Solve for the full transition path to the new steady state.
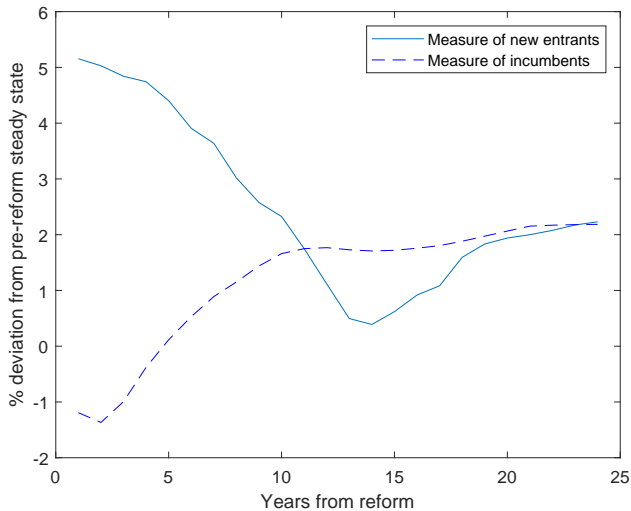
Calibration and Quantitative Exercise

- Run the quantitative exercise 3 times:

  (1) Baseline (all of the model's features in place),

  (2) Role of dynamics: comparison with static analogue,

  (3) Role of financial frictions (costly equity issuance): comparison with frictionless analogue.
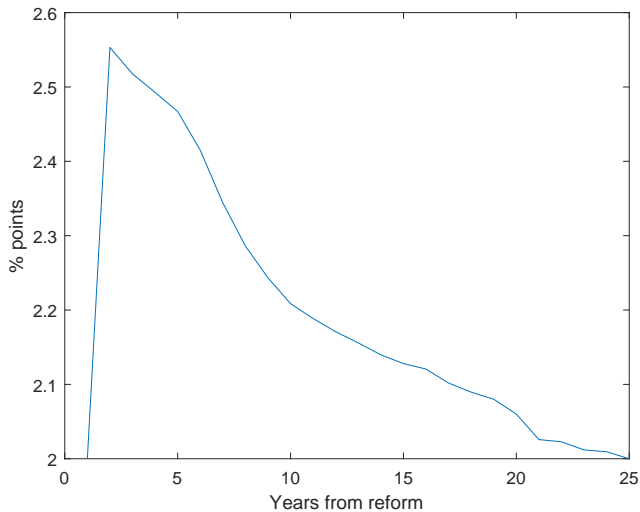
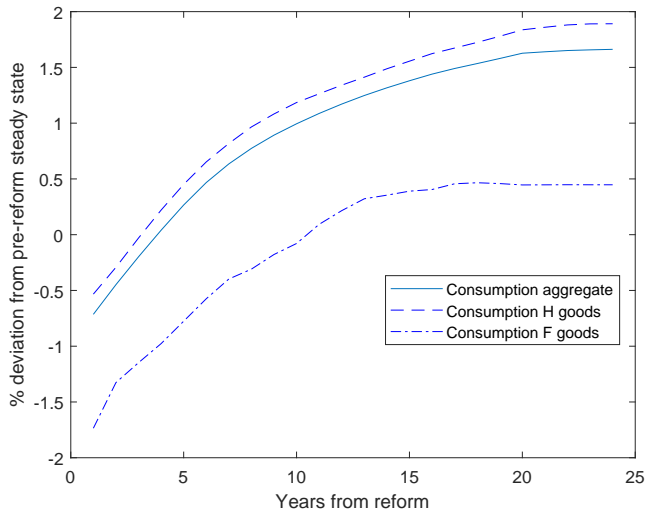# (1) Baseline
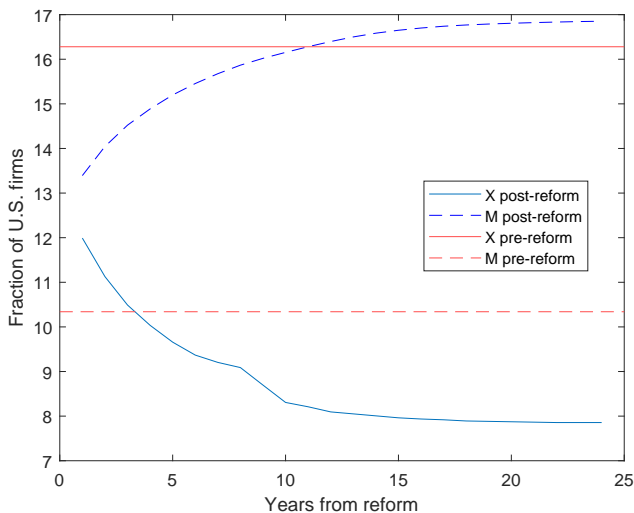
U.S. firms serving F market

(1) Baseline

U.S. firm measures

(1) Baseline

U.S. riskless rate

(1) Baseline

U.S. consumption

(1) Baseline

Variable	Cumulative Change (%)
Capital (domestic) of U.S. firms	0.20
Capital (abroad) of U.S. firms	57.12
Domestic production of U.S. goods	0.10
Domestic price of U.S. goods	-2.93
Productivity U.S. firms	0.52
Tax collections by U.S.	0.00
U.S. welfare	0.98

(2) Role of Dynamics
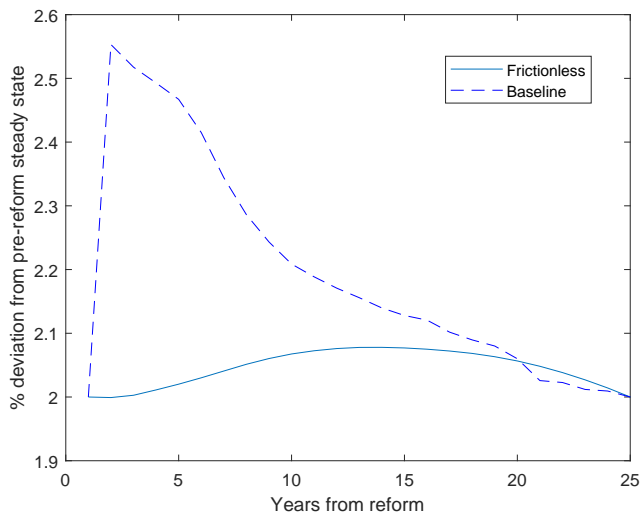
- SM: static model.

- BL: baseline.

(2) Role of Dynamics

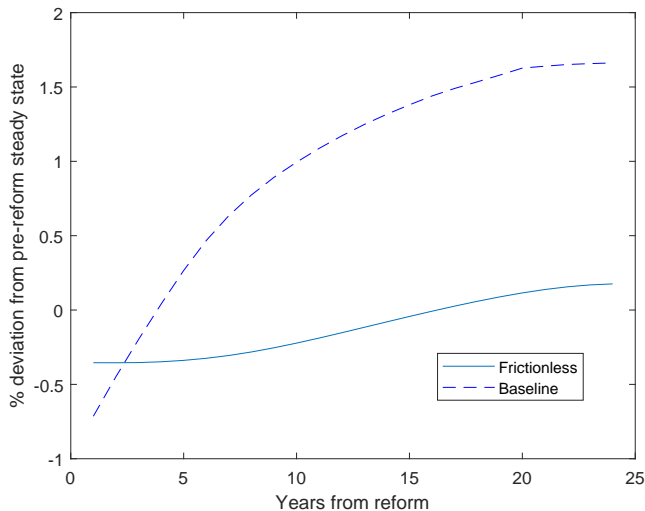|	Change (%)	
Variable	**SM**	**BL**
Domestic production of U.S. goods	-0.85	0.10
Domestic price of U.S. goods	-0.55	-2.93
Productivity of U.S. firms	0.00	0.52
Tax collections in U.S.	-8.17	0.00
U.S. welfare	-0.95	0.98

(3) Role of Financial Frictions

- FL: frictionless model (equity issuance cost parameters are zero).

- BL: baseline.

(3) Role of Financial Frictions

U.S. riskless rate

(3) Role of Financial Frictions

U.S. consumption

(3) Role of Financial Frictions

	Change (%)	
Variable	**FL**	**BL**
Capital (domestic) of U.S. firms	0.09	0.20
Capital (abroad) of U.S. firms	4.97	57.12
Riskless bonds	1.83	9.76
Domestic production of U.S. goods	0.02	0.10
Tax collections in U.S.	-3.62	0.00
U.S. welfare	0.23	0.98

Conclusion

- How do tax reforms targeted at multinationals affect the macroeconomy?

- My contribution is twofold

  (1) Methodological: new general framework.

  (2) Policy application: U.S. repatriation tax.

Conclusion

- Punchline:

    - Heterogeneity matters,

    - Dynamics matter,

    - Financial frictions matter.

- U.S. application: 1% ↑ in welfare and approximate revenue neutrality.